LibertyQ US Equity Index Series

v1.9

The LibertyQ US Equity Index Series is not, and is not intended to be, used by supervised entities in the European Union or the United Kingdom and accordingly, the European Benchmark Regulation* and the UK Benchmark Regulation# does not apply to the index series. Consequently, supervised entities within the European Union and the United Kingdom are not permitted to use any of the indices within the index series as a benchmark as set out in article 3(1)(7) of the European Benchmark Regulation.

For the avoidance of doubt, neither FTSE International Limited nor any other member of the London Stock Exchange Group plc group of companies, is the benchmark administrator (as defined in article 3(1)(6) of the European Benchmark Regulation) of the index series.

*Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds

#The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019 (which amends the European benchmark regulation in the United Kingdom)

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Section 1

Introduction

1. Introduction

1.1 This document sets out the ground rules for the construction and management of the LibertyQ US Equity Index Series. Copies of the ground rules are available from www.ftserussell.com.

1.2 The LibertyQ US Equity Index Series is designed to reflect the performance of stocks representing a specific set of factor characteristics.

1.3 These ground rules should be read in conjunction with the Corporate Actions and Events Guide for Non Market Cap Weighted Indices and the Russell US Equity Indices construction and methodology, which are available at www.ftserussell.com. Unless stated in these ground rules, the LibertyQ US Equity Index Series will follow the same process as the Russell US Equity Index Series.

1.3.1 The LibertyQ US Equity Index does not take account of ESG factors in its design.

1.4 Price and total return indices will be calculated on an end-of-day basis.

Total return indices include income based on ex-dividend adjustments. All dividends are applied as declared in the FTSE Total Return Index.

1.5 The indices may be calculated in real time (see Appendix A).

1.6 Statement of Principles for FTSE Russell Non Market Capitalisation Weighted Equity Indices (the Statement of Principles)

Indices need to keep abreast of changing markets and the ground rules cannot anticipate every eventuality. Where the ground rules do not fully cover a specific event or development, FTSE Russell will determine the appropriate treatment by reference to the Statement of Principles, which summarises the ethos underlying FTSE Russell's approach to index construction. The Statement of Principles is reviewed annually and any changes proposed by FTSE Russell are presented to the FTSE Russell Policy advisory board for discussion before approval by FTSE Russell's Index governance board.

The Statement of Principles can be accessed using the following link:

Statement_of_Principles_Non-Market_Cap_Equity_Indices.pdf

1.7 FTSE Russell hereby notifies users of the index series that it is possible that circumstances, including external events beyond the control of FTSE Russell, may necessitate changes to, or the cessation of, the index series and therefore, any financial contracts or other financial instruments that reference the index series should be able to withstand, or otherwise address the possibility of changes to, or cessation of, the index series.

1.8 Index users who choose to follow this index series or to buy products that claim to follow this index series should assess the merits of the index series rules-based methodology and take independent investment advice before investing their own or client funds. No liability whether as a result of negligence or otherwise is accepted by FTSE Russell (or any person concerned with the preparation or publication of these ground rules) for any losses, damages, claims and expenses suffered by any person as a result of:

– any reliance on these ground rules;

- any inaccuracies in these ground rules;
- any non-application or misapplication of the policies or procedures described in these ground rules, and/or
- any inaccuracies in the compilation of the index series or any constituent data.

Section 2

Management responsibilities

2. Management responsibilities

2.1 FTSE International Limited (FTSE)

2.1.1 FTSE[1] is responsible for the daily calculation, production and operation of the index series, and will:

- maintain records of the index weightings of all constituents;
- make changes to the constituents and their weightings in accordance with the ground rules;
- carry out periodic index reviews of the index series and apply the changes resulting from the reviews as required by the ground rules;
- publish changes to the constituent weightings resulting from their ongoing maintenance and the periodic reviews; and
- disseminate the indices.

2.2 Amendments to these ground rules

2.2.1 These ground rules shall be subject to regular review by FTSE Russell to ensure that they continue to best reflect the aims of the index series. Any proposals for significant amendments to these ground rules will be subject to consultation with FTSE Russell advisory committees and other stakeholders if appropriate. The feedback from these consultations will be considered by the FTSE Russell Index governance board before approval is granted.

2.2.2 Where FTSE Russell determines that the ground rules are silent or do not specifically and unambiguously apply to the subject matter of any decision, any decision shall be based as far as practical on the Statement of Principles. After making any such determination, FTSE Russell shall advise the market of its decision at the earliest opportunity. Any such treatment will not be considered as an exception or change to the ground rules, or to set a precedent for future action, but FTSE Russell will consider whether the ground rules should subsequently be updated to provide greater clarity.

[1] FTSE is not the benchmark administrator of the index series as the term administrator is defined in the IOSCO Principles for Financial Benchmarks and Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds (the European Benchmark Regulation) and The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019 (the UK Benchmark Regulation).

Section 3

Queries and complaints

3. Queries and complaints

FTSE Russell's complaints procedure can be accessed using the following link:

Benchmark_Determination_Complaints_Handling_Policy.pdf

Section 4

Eligible securities

4. Eligible securities

4.1.1 Constituent securities as defined by the underlying benchmark indices are eligible for inclusion in the LibertyQ US Equity Index Series.

4.1.2 Benchmark indices of the LibertyQ US Equity Index Series:

Underlying index	LibertyQ index
Russell 1000 Index	LibertyQ US Large Cap Index
Russell Midcap Index	LibertyQ US Mid Cap |Index
Russell 2000 Index	LibertyQ US Small Cap Index

4.1.3 At the quarterly review, securities that are affiliated with Franklin Resources by either a direct or indirect aggregate shareholding of greater than 20% will be excluded from the underlying index.

Section 5

Factor construction

5. Factor construction

The data cut-off date for the calculation of all factor data is the close of business on the last business day of the month prior to the review month, with the exception of December which will use the last business day in October.

5.1 Factor normalisation and missing data treatment

5.1.1 The z-score for a factor is computed by combining the relative z-scores of the individual descriptors defined for each factor.

5.1.2 The z-score for a descriptor for each security is calculated as described below:

LibertyQ US Large Cap Index

$$Z_i^j = \frac{D_i^j - \bar{D}_i^j}{\sigma(D_i^j)}$$

Where:

$Z_{i,j}$ is the individual descriptor z-score for stock *i* for descriptor *j*.

$D_{I,j}$ is the descriptor value of stock *i* for descriptor *j*.

$\bar{D}_i^j$ is the equal weighted mean of the descriptor values for descriptor *j* of all the securities included in the underlying parent index within same ICB industry.

$\sigma(D_i^j)$ is the equal weighted standard deviation of the descriptor values for descriptor *j* of all the securities included in the underlying index within same ICB industry.

The z-scores are winsorised at +/-3 (i.e., the z-scores above three are capped at three and z-scores below - three are floored at - three).

LibertyQ US Mid Cap Index/LibertyQ US Small Cap Index

$$Z_i^j = \frac{D_i^j - \bar{D}_i^j}{\sigma(D_i^j)}$$

Where:

$Z_{i,j}$ is the individual descriptor z-score for stock *i* for descriptor *j*.

$D_{i,j}$ is the descriptor value of stock *i* for descriptor *j*.

$\bar{D}_i^j$ is the equal weighted mean of the descriptor values for descriptor *j* of all the securities included in the underlying parent index.

$\sigma(D_i^j)$ is the equal weighted standard deviation of the descriptor values for descriptor j of all the securities included in the parent index

The z-scores are winsorised at +/- 3 (i.e. the z-scores above three are capped at three and z-scores below - three are floored at - three).

5.1.3 All descriptors with missing data are allocated the industry average z-score for LibertyQ US Large Cap Index and are allocated the universe average z-score for LibertyQ US Mid Cap Index/LibertyQ US Small Cap Index after the normalisation procedure in rule 5.1.2.

5.1.4 For LibertyQ US Mid Cap Index/LibertyQ US Small Cap Index, the relative z-score of a descriptor is defined by standardising the individual descriptor z-scores within the sector groups.

The three sector groups defined to apply relative z-scores are:

a. securities belonging to the ICB[2] financials industry (ICB financials 30) of the Industry Classification Benchmark (ICB);

b. securities belonging to the ICB real estate investment trusts sector of the ICB (real estate investment trusts 351020 and mortgage real estate investment trusts 302030); and

c. securities belonging to all other ICB industries except the financials industry (ICB financials 30) and real estate investment trusts sector (real estate investment trusts 351020 and mortgage real estate investment trusts 302030).

The relative z-scores within each sector group are calculated as described below:

$$Zrel_i^j = \frac{Z_i^j - \bar{Z}_i^j}{\sigma(Z_i^j)}$$

Where:

$Zrel_{i,j}$ is the relative z-score for stock *i* for descriptor *j*.

$Z_{i,j}$ is the descriptor z-score of stock *i* for descriptor *j* within a sector group.

$\bar{Z}_i^j$ is the equal weighted mean of the descriptor z-scores for descriptor *j* of all the securities included in a sector group.

$\sigma(Z_i^j)$ is the equal weighted standard deviation of the descriptor z-scores for descriptor *j* of all the securities included in a sector group.

The relative z-scores for each sector group universe are winsorised at +/- 3.

5.2 Volatility

5.2.1 The volatility descriptor is defined as the slope coefficient β in a time-series regression of local stock total returns against the local total returns of the benchmark index:

$$r_i = \alpha + \beta R + e$$

where r_i is the weekly local total return from Wednesday to Wednesday of stock i over the trailing 104 weeks of the cut-off date and R is the weekly local total return from Wednesday to Wednesday of the benchmark index over the trailing 104 weeks of the cut-off date.

5.2.2 Stocks with history of less than 104 weeks will be treated as missing data.

5.2.3 A relative z-score for the volatility descriptor is created following the procedure detailed in rule 5.1 and the volatility factor is the relative z-score of the volatility descriptor.

[2] FTSE indices migrated to the new ICB classification system in March 2021.

5.3 Momentum

5.3.1 The momentum factor contains two descriptors: six-month risk-adjusted price momentum and 12-month risk-adjusted price momentum.

5.3.2 Six-month risk-adjusted price momentum is defined as the cumulative local daily price return over the trailing six months of the cut-off date divided by the annualised standard deviation of weekly local price returns (Wednesday to Wednesday) over the trailing three years of the cut-off date.

5.3.3 Twelve-month risk-adjusted price momentum is the cumulative local daily price return over the trailing 12 months of the cut-off date divided by the annualized standard deviation of weekly local price returns (Wednesday to Wednesday) over the trailing three years of the cut-off date.

5.3.4 If a stock has history of less than three years, it will be treated as missing data.

5.3.5 The relative z-score of individual descriptors is created following the procedure detailed in rule 5.1 and the momentum factor is the average relative z-scores of six-month and 12-month risk-adjusted price momentum.

5.4 Quality

5.4.1 The following descriptors are used to build the quality factor:

a. Return on equity

$$\frac{Latest\ 12\ month\ Net\ Income}{Average\ Shareholders'\ Equity} * 100$$

Net income is the trailing 12-month net income as of the data cut-off date. Net income is defined as earnings from continuing operations before preferred dividends and excluding discontinued operations and extraordinary items sourced from Refinitiv Worldscope. Shareholders' equity is the average of the most recent and previous fiscal year's total shareholders' equity as of the data cut-off date.

b. Earnings variability

Earnings variability is defined as the standard deviation of the most recent five fiscal years annual earnings per share growth.

c. Cash ROA

$$\frac{Latest\ Fiscal\ Year\ Net\ Operating\ Cash\ Flow}{Latest\ Fiscal\ Year\ Total\ Assets} * 100$$

Latest fiscal year net operating cash flow and total assets are sourced from Refinitiv Worldscope.

d. Operating cash flow to sales

$$\frac{Latest\ 12\ month\ Net\ Operating\ Cash\ Flow}{Latest\ 12\ month\ Sales} * 100$$

Net operating cash flow and sales are the trailing 12-month values as of the data cut-off date and sourced from Refinitiv Worldscope.

e. Leverage

The leverage descriptor value is the average of three components: market leverage, book leverage and debt-to-assets ratio, where:

Market leverage = $\frac{Company\ Investable\ Market\ Cap+Preferred\ Equity+Long\ Term\ Debt}{Company\ Investable\ Marcket\ Cap}$

Book leverage = $\frac{Book\ Value+Preferred\ Equity+Long\ Tem\ Debt}{Book\ Value}$

Debt to assets = $\frac{Total\ Debt}{Total\ Assets}$

Note:

a. Company investable market cap is as of the data cut-off date.

b. Preferred equity, long-term debt, book value, total debt and total assets are the most recent available data prior to the data cut-off date and are sourced from Refinitiv Worldscope.

c. If company investable market cap, preferred equity or long-term debt is missing, the market leverage will be treated as missing data.

d. If book value, preferred equity or long-term debt is missing, the book leverage will be treated as missing data.

e. If any of the market leverage, book leverage or debt to assets data is missing, the leverage factor will be the average of the available components.

f. Gross profit over asset

$$\frac{Latest\ Fiscal\ Year\ Gross\ Income}{Latest\ Fiscal\ Year\ Total\ Assets} * 100$$

Latest fiscal year gross income and total assets are source from Refinitiv Worldscope.

g. Gross margin sustainability

$$\frac{Avearge\ Gross\ Margin\ over\ Last\ 5\ Fiscal\ Years}{Standard\ Deviation\ of\ Gross\ Margin\ over\ Last\ 5\ Fiscal\ Years} * 100$$

Last five fiscal years gross margin is sourced from Refinitiv Worldscope.

h. ROA sustainability

$$\frac{Average\ Cash\ ROA\ over\ Last\ 5\ Fiscal\ Years}{Standard\ Deviation\ of\ Cash\ ROA\ over\ Last\ 5\ Fiscal\ Years} * 100$$

Cash ROA is defined in rule 5.4.1 c.

i. Return on asset

$$\frac{Latest\ 12\ month\ net\ income}{Average\ Total\ Asset} * 100$$

Net income is the trailing 12-month net income as of the data cut-off date. Net income is defined as earnings from continuing operations before preferred dividends and excluding discontinued operations and extraordinary items sourced from Refinitiv Worldscope. Total asset is the average of the most recent and previous fiscal year's total asset as of the data cut-off date.

5.4.2 The relative z-score of individual descriptors is created following the procedure detailed in rule 5.1 and quality factor is:

LibertyQ US Large Cap Index

A. Average relative z-scores of the return on equity, earnings variability and ROA for stocks in the financials industry (ICB financials 30).

B. Average relative z-scores of the earnings variability, ROA and operating cash flow to sales for stocks in the real estate industry (ICB real estate 35).

C. Average relative z-scores of the return on equity, earnings variability, cash ROA and leverage for stocks in all the other industries.

LibertyQ US Mid Cap Index

A. Average relative z-scores of the cash ROA and ROA sustainability for financials.

B. Average relative z-scores of the cash ROA and ROA sustainability for REITs.

C. Average relative z-scores of the return on equity, gross profit over asset and gross margin sustainability for real estate excluding REITs and all the other industries.

LibertyQ US Small Cap Index

A. Average relative z-scores of the cash ROA and ROA sustainability for financials.

B. Average relative z-scores of the cash ROA and ROA sustainability for REITs.

C. Average relative z-scores of the return on equity, gross profit over asset and gross margin sustainability for real estate excluding REITs and all the other industries.

5.5 Value

5.5.1 The following descriptors are used to build the value factor:

a. Book to price

$$\frac{Latest\ Book\ Value}{Market\ Capitalisation} * 100$$

Book value is sourced from Refinitiv Worldscope as of the data cut-off date. Market capitalisation is the full market capitalisation as of the data cut-off date.

b. Dividend yield

$$\frac{Latest\ 12\ month\ Trailing\ Dividend}{Market\ Capitalisation} * 100$$

Latest 12-month trailing dividend is the sum of ordinary and extra dividends from Refinitiv Worldscope as of the data cut-off date. Market capitalisation is the full market capitalisation as of the data cut-off date.

c. Earnings yield

$$\frac{Lasest\ 12\ month\ Net\ Income}{Market\ Capitalisation} * 100$$

Net income is the trailing 12-month net bottom line as of the data cut-off date. Net income bottom line is before deduction of preferred dividends and is sourced from Refinitiv Worldscope. Market capitalisation is the full market capitalisation as of the data cut-off date.

d. Twelve-month forward earnings yield

$$\left(12M\ Fwd\frac{EPS}{Price}\right) * 100$$

Twelve-month forward EPS is the time-weighted average of the IBES mean FY1 and FY2 EPS estimates, where the weights are determined by the proportion of the current fiscal year remaining as of the data cut-off date. The forward earnings yield is the 12-month forward EPS divided by price at the data cut-off date.

e. EBITDA to enterprise value

$$\frac{Latest\ 12\ month\ EBITDA}{Enterprise\ Value} * 100$$

EBITDA is the trailing 12-month earnings before interest, taxes, depreciation and amortisation as of the data cut-off date. Enterprise value is the sum of the company full market capitalisation and net debt as of the data cut-off date. EBITDA and net debt are sourced from Refinitiv Worldscope.

5.5.2 The relative z-score of individual descriptors is created following the procedure detailed in rule 5.1 and value factor is:

LibertyQ US Large Cap Index

A. For stocks in the financials industry: 2/3 relative z-scores of the book to price ratio + 1/3 relative z-score of dividend yield.

B. For stocks in the real estate industry: 2/3 relative z-scores of the book to price ratio + 1/3 relative z-score of dividend yield.

C. For stocks in all the other industries: average relative z-scores of the dividend yield, earnings yield and 12-month forward earnings yield.

LibertyQ US Mid Cap Index

A. For Financials: 2/3 relative z-scores of the book to price ratio + 1/3 relative z-score of dividend yield.

B. For REITs: 2/3 relative z-scores of the book to price ratio + 1/3 relative z-score of dividend yield.

C. For real estate excluding REITs and all the other industries: average relative z-scores of the dividend yield, EBITDA to enterprise value ratio and 12-month forward earnings yield.

LibertyQ US Small Cap Index

A. For financials: 2/3 relative z-scores of the book to price ratio + 1/3 relative z-score of dividend yield.

B. For REITs: 2/3 relative z-scores of the book to price ratio + 1/3 relative z-score of dividend yield.

C. For real estate excluding REITs and all the other industries: average relative z-scores of the dividend yield, EBITDA to enterprise value ratio and 12-month forward earnings yield.

5.6 Outlier treatment

5.6.1 LibertyQ US Large Cap Equity Index

Top and bottom 0.5% values of each descriptor excluding DY and leverage will be defined as outliers. For DY, only largest 0.5% values will be defined as outlier. For leverage, the outliers will be defined at the component level, where the largest 0.5% values of debt to assets will be defined as outliers. For the book leverage and market leverage components of the leverage descriptor, the largest 0.5% values and all the values less than one will be defined as outliers.

LibertyQ US Mid Cap Equity Index

Top and bottom 0.5% values of each descriptor excluding DY will be defined as outliers. For DY, only largest 0.5% values will be defined as outlier.

LibertyQ US Small Cap Equity Index

Top and bottom 1% values of each descriptor excluding DY will be defined as outliers. For DY, only largest 1% values will be defined as outlier.

5.6.2 Median value of the universe excluding null values will be assigned to outliers for all descriptors and the components except book leverage and market leverage, where median value is calculated based on universe excluding null values and values less than one.

5.7 Index back-histories

5.7.1 The availability of factor data prior to the December 2016 launch date of the LibertyQ US Large Cap Equity Index is simulated through the application of a three-month lag on fundamental data. All index reviews prior to this date that utilise realised fundamental data incorporate a lag of three months.

5.7.2 The availability of factor data prior to the March 2017 launch date of the LibertyQ US Mid Cap Equity Index and the LibertyQ US Small Cap Equity Index is simulated through the application of a three-month lag on fundamental data. All index reviews prior to this date that utilise realised fundamental data incorporate a lag of three months.

Section 6

Index construction

6. Index construction

6.1 Determination of factor score

6.1.1 Calculating the composite factor z-score

The composite factor z-score is computed from the factor z-scores described below.

LibertyQ US Large Cap Index

$$Zcomp_i = 0.40 \times Zquality_i + 0.30 \times Zvalue_i + 0.30 \times Zmomentum_i$$

LibertyQ US Mid Cap Index/LibertyQ US Small Cap Index

$$Zcomp_i = 0.50 \times Zquality_i + 0.30 \times Zvalue_i + 0.10 \times Zmomentum_i + 0.10 \times Zvolatility_i$$

Where:

$Zcomp_i$ is the composite factor z-score for stock *i*.

$Zquality_i$ is the quality factor z-score of stock *i*.

$Zvalue_i$ is the value factor z-score of stock *i*.

$Zmomentum_i$ is the momentum factor z-score of stock *i*.

$Zvolatility_i$ is the volatility factor z-score of stock *i*.

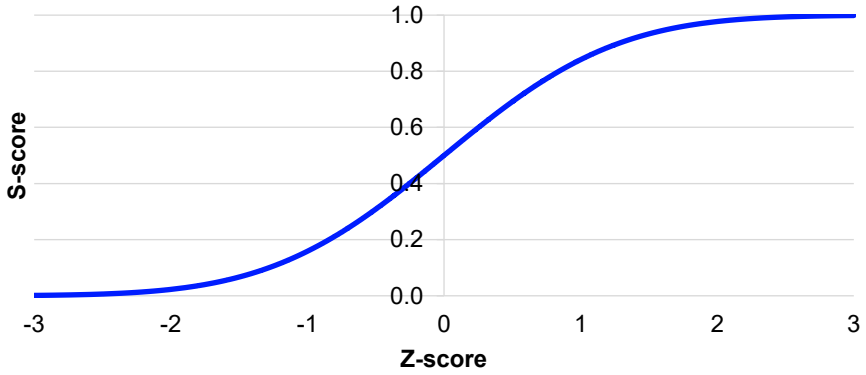
6.1.2 Calculating the final factor score

Composite factor z-scores are mapped to a score $S_i \epsilon (0, 1)$, using the cumulative normal distribution with mean zero and standard deviation one.

$$S_i = CN(Z_i) = \int_{-\infty}^{Z_i} \frac{e^{-x^2/2}}{\sqrt{2\pi}} dx \quad (1)$$

Chart one illustrates the relationship between z-scores and mapped z-scores.

Chart one: mapping factor z-score to s-score



6.2 Security selection and weighting scheme

6.2.1 LibertyQ US Large Cap Index

The securities with benchmark weight greater or equal to 1% are selected for inclusion to the LibertyQ US Large Cap Index and the total weights in the final index w_a is the sum of their benchmark weights.

The top 20% of the remaining constituents in the underlying universe with the highest composite factor z-score are also selected for inclusion to the LibertyQ US Large Cap Index (subject to rule 6.3) and the total final index weights is 1-wa.

LibertyQ US Mid and Small Cap Index

The top 25% of constituents in the parent index with the highest composite factor z-score are selected for inclusion to the LibertyQ US Equity Index (subject to rule 6.3).

6.2.2 The securities included are assigned weights in the proportion of market cap weight x final factor score:

$$\widehat{W}_i = \frac{S_i * W_i}{\sum_j S_j * W_j} \quad (2)$$

where W_i are the underlying eligible universe market capitalisation index weights.

6.3 Buffer rules

To reduce turnover and enhance index stability, buffer rules are applied as follows.

6.3.1 Security selection buffer

A security selection buffer of 50% is applied at each index review.

LibertyQ US Large Cap Index

Securities in the underlying universe are ranked by their composite factor z-score in descending order. The securities ranked within top 10% (rounded to the nearest integer) will be included in the index. Existing constituents not included in the previous step that rank at or within 30% (rounded to the nearest integer) are then successively added until the number of securities reaches the 20% target representation. If the number of securities is below the 20% target representation after this step, the remaining securities in the underlying index with the highest composite factor z-score are added until the number of securities in the index reaches the target representation.

LibertyQ US Mid and Small Cap Index

Securities in the parent index are ranked by their composite factor z-score in descending order. The securities ranked within top 12.5% (rounded to the nearest integer) will be included in the index. Existing constituents not included in the previous step that rank at or within 37.5% (rounded to the nearest integer) are then successively added until the number of securities reaches the 25% target representation. If the number of securities is below the 25% target representation after this step, the remaining securities in the Parent Index with the highest composite factor z-score are added until the number of securities in the index reaches the target representation.

6.3.2 Turnover buffer

A turnover buffer of 50% is applied at each index review. If the ongoing rebalancing results in changing the weight of a security from x% to y% in the index, where x% is the security index weight from data cut-off date and y% is the indicative security index weight from rule 6.2, then the effective change in weight will be:

$$\text{Effective pro forma constituent weight} = x + (y - x)/2 \qquad (3)$$

The turnover buffer is applied to the uncapped weights of existing and pro forma constituents and is not applied to deletions. Any resulting excess weight will be redistributed amongst the index constituents.

6.3.3 Maximum and minimum stock weight

LibertyQ US Large Cap Index

A max weight cap of minimum of (benchmark weight + 1%, 10 * benchmark weight) is applied across all the securities and a min weight floor of maximum of (benchmark weight - 1%, 0.1%) is applied across all securities. Any resulting excess weight will be redistributed amongst the remaining constituents and may cause breaches to the constraints in rule 6.3.2.

LibertyQ US Mid Cap Index/LibertyQ US Small Cap Index

A maximum issuer level weight cap of 1% is applied to the LibertyQ US Mid Cap Index and LibertyQ US Small Cap Index. Any resulting excess weight will be redistributed amongst the remaining constituents and may cause breaches to the constraints in rule 6.3.2.

Section 7

Periodic review of constituents

7. Periodic review of constituents

7.1 Review dates

7.1.1 The LibertyQ US Large Cap Index will be reviewed quarterly in March, June, September and December.

Reviews will be based on the data at the close of business on the last trading day of the month prior to review except for December which will use data as of the last trading day of October. Constituents are used based on the Monday following the third Friday of the review month for March, September and using constituents as of the corresponding benchmark index review implementation date for the June review and December reviews.

The LibertyQ US Mid Cap Index and LibertyQ US Small Cap Index will be reviewed semi-annually in June and December, based on data at the close of business on the last trading day of the May for June review and the last trading day of October for the December review. Constituents are determined using the constituents as of the corresponding benchmark index review implementation date for the both reviews.

7.1.2 Changes arising from the March and September reviews are announced after the close on the Wednesday following the first Friday of the review month, seven trading days prior to the implementation of the LibertyQ US Equity Index Series review. The review will be implemented after the close of business on the third Friday of the review month.

7.1.3 Changes arising from the June and December reviews are announced seven trading days prior to the implementation of the LibertyQ US Equity Index Series review. The review will be implemented on the same date as the benchmark Index annual reconstitution. For details of the implementation dates of the benchmark index, please refer to the Russell US Equity Indices Construction and Methodology, available at Russell-US.

Section 8

Changes to constituent companies

8. Changes to constituent companies

8.1 Intra-review additions

8.1.1 Additions to the Russell Index (e.g. IPOs) will be considered for inclusion in the LibertyQ US Equity Index at the next review. Companies added to the Russell Index as a consequence of a corporate action (e.g. a spin-off) will be added to the LibertyQ US Index Series at the time of the event, in accordance with the Corporate Actions and Events Guide for Non Market Cap Weighted Indices.

8.2 Intra-review deletions

8.2.1 A stock that is removed from the Russell Index will be removed from the LibertyQ US Equity Index Series. A minimum of two days' notice will be provided and its weight will be distributed pro-rata amongst the remaining constituents in the relevant index.

Section 9

Corporate actions and events

9. Corporate actions and events

9.1 If a constituent in the underlying index has a stock split, stock consolidation, rights issue, bonus issue, a change in the number of shares in issue or a change in free float (with the exception of tender offers), the constituent's weighting in the corresponding Index will remain unchanged pre and post such an event.

9.2 Full details of changes to constituent companies due to corporate actions and events can be accessed in the Corporate Actions and Events Guide for Non Market Cap Weighted Indices using the following link:

Corporate_Actions_and_Events_Guide_for_Non_Market_Cap_Weighted_Indices.pdf

A corporate action is an action on shareholders with a prescribed ex-date. The share price will be subject to an adjustment on the ex-date. The index will be adjusted in line with the ex-date.

These include the following:

– capital repayments;

– rights issues/entitlement offers;

– stock conversion;

– splits (sub-division)/reverse splits (consolidation); and

– scrip issues (capitalisation or bonus issue).

A corporate event is a reaction to company news (event) that may impact the index depending on the index rules. For example, a company announces a strategic shareholder is offering to sell their shares (secondary share offer) – this could result in a free float weighting change in the index. Where an index adjustment is required, FTSE Russell will provide notice advising of the timing of the change.

9.3 Suspension of dealing

Suspension of dealing rules can be found within the Corporate Actions and Events Guide for Non Market Cap Weighted Indices.

9.4 Takeovers, mergers and demergers

The treatment of takeovers, mergers and demergers can be found within the Corporate Actions and Events Guide for Non Market Cap Weighted Indices.

Section 10

Indices algorithm and calculation method

10. Indices algorithm and calculation method

10.1 Prices

10.1.1 The index uses actual closing mid-market or last trade prices, where available, for securities with local market quotations. Further details can be accessed using the following link:

Closing_Prices_Used_For_Index_Calculation.pdf

10.2 Calculation frequency

10.2.1 The index will be calculated on an end of day basis and displayed to eight decimal points.

10.3 Index calculation

10.3.1 The index is calculated using the algorithm described below:

$$\sum_{i=1}^{N} \frac{(p_i \times e_i \times s_i \times f_i \times c_i)}{d}$$

Where:

- $i=1,2,\ldots,N$;
- N is the number of securities in the index;
- p_i is the latest trade price of the component security (or the price at the close of the index on the previous day);
- e_i is the exchange rate required to convert the security's currency into the index's base currency;
- s_i is the number of shares in issue used by FTSE Russell for the security, as defined in these ground rules;
- f_i is the investability weighting factor to be applied to a security to allow amendments to its weighting, expressed as a number between 0 and 1, where 1 represents a 100% free float. This factor is published by FTSE Russell for each security in the underlying index;
- c_i is the weighting factor to be applied to a security to correctly weight that security in the index. This factor maps the investable market capitalisation of each stock to a notional market capitalisation for inclusion in the index; and
- d is the divisor, a figure that represents the total issued share capital of the Index at the base date. The divisor can be adjusted to allow changes in the issued share capital of individual securities to be made without distorting the index.

Appendix A

Index opening and closing hours

Index	Open	Close
Monday to Friday		
LibertyQ US Equity Index Series	9:30	16:10

Notes:

1. Closing prices are downloaded from Refinitiv at 16:30. Since the New York Stock Exchange, NYSE Arca and NASDAQ do not release official closing prices until several hours later, the price used in the index may not match this official close. If the downloaded closing price is subsequently overwritten by the official closing price, the downloaded closing price is retained in the index calculation.
2. The indices will be calculated during normal trading hours of the New York Stock Exchange, NYSE Arca and NASDAQ will be closed on US holidays.
3. Timings are based on Eastern Standard Time (EST).

Appendix B

Status of index

The index may be calculated in real time.

For further details of real time definitions please refer to the following guide:

Real_Time_Status_Definitions.pdf

The official opening and closing hours of the indices are set out in Appendix A. Variations to the official hours of the Indices will be published by FTSE Russell.

The index series will not be calculated on public holidays.

Appendix C

Further information

A Glossary of Terms used in FTSE Russell's ground rule documents can be found using the following link:

Glossary.pdf

For contact details, please visit the FTSE Russell website or contact FTSE Russell client services at info@ftserussell.com.

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